

SEQUENCE LISTING

<110> Rosanne M. Crooke
Mark J. Graham

<120> ANTISENSE MODULATION OF APOLIPOPROTEIN(A) EXPRESSION

<130> ISPH-0595

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<170> FastSEQ for Windows Version 4.0

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<220>

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<210> 3

<211> 13938

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (46)...(13692)

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Glu Val Val Leu Leu Leu Leu Phe Leu Lys Ser Ala Ala Pro Glu
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Arg	Gly	Thr	Tyr	Ser	Thr	Thr	Val	Thr	Gly	Arg	Thr	Cys	Gln	Ala	Trp	
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Ser	Ser	Met	Thr	Pro	His	Gln	His	Asn	Arg	Thr	Thr	Glu	Asn	Tyr	Pro	
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Asn	Ala	Gly	Leu	Ile	Met	Asn	Tyr	Cys	Arg	Asn	Pro	Asp	Ala	Val	Ala	
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gct	cct	tat	tgt	tat	acg	agg	gat	ccc	ggg	gtc	agg	tgg	gag	tac	tgc	345
Ala	Pro	Tyr	Cys	Tyr	Thr	Arg	Asp	Pro	Gly	Val	Arg	Trp	Glu	Tyr	Cys	
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Asn	Leu	Thr	Gln	Cys	Ser	Asp	Ala	Glu	Gly	Thr	Ala	Val	Ala	Pro	Pro	
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Thr	Val	Thr	Pro	Val	Pro	Ser	Leu	Glu	Ala	Pro	Ser	Glu	Gln	Ala	Pro	
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Thr	Glu	Gln	Arg	Pro	Gly	Val	Gln	Glu	Cys	Tyr	His	Gly	Asn	Gly	Gln	
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Ser	Tyr	Arg	Gly	Thr	Tyr	Ser	Thr	Thr	Val	Thr	Gly	Arg	Thr	Cys	Gln	
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Ala	Trp	Ser	Ser	Met	Thr	Pro	His	Ser	His	Ser	Arg	Thr	Pro	Glu	Tyr	
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Tyr	Pro	Asn	Ala	Gly	Leu	Ile	Met	Asn	Tyr	Cys	Arg	Asn	Pro	Asp	Ala	
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Tyr	Cys	Asn	Leu	Thr	Gln	Cys	Ser	Asp	Ala	Glu	Gly	Thr	Ala	Val	Ala	
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Gly Gln Ser Tyr	Arg Gly Thr Tyr Ser	Thr Thr Val Thr Gly Arg Thr																			
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tgc caa gct tgg tca tct atg aca cca cac tcg cat agt cgg acc cca	921																				
Cys Gln Ala Trp Ser Ser Met Thr Pro His Ser His Ser Arg Thr Pro																					
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gaa tac tac cca aat gct ggc ttg atc atg aac tac tgc agg aat cca	969																				
Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro																					
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gat gct gtg gca gct cct tat tgt tat acg agg gat ccc ggt gtc agg	1017																				
Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg																					
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tgg gag tac tgc aac ctg acg caa tgc tca gac gca gaa ggg act gcc	1065																				
Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala																					
	325	330	335	340																	
gtc gcg cct ccg act gtt acc ccg gtt cca agc cta gag gct cct tcc	1113																				
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Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr Val	
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Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His Ser His	
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Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr	
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Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp	
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Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala	
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Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro Ser Leu	
565 570 575 580	
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Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly Val Gln	
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Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr	
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Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His	
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Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met	
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agg gat ccc ggt gtc agg tgg gag tac tgc aac ctg acg caa tgc tca	2073
Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser	
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Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro	
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Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly	
695 700 705	

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Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr	
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Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr	
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Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu	
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Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys	
760 765 770	
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Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro	
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Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly	
825 830 835	
aca tac tcc acc act gtc aca gga aga acc tgc caa gct tgg tca tct	2601
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Met Thr Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala	
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Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu	
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Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val	
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Ser	Tyr	Arg	Gly	Thr	Tyr	Ser	Thr	Thr	Val	Thr	Gly	Arg	Thr	Cys	Gln	
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Ala	Trp	Ser	Ser	Met	Thr	Pro	His	Ser	His	Ser	Arg	Thr	Pro	Glu	Tyr	
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1125				1130						1135				1140		
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Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser	
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Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro	
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Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly	
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Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu	
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Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys	
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Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg	
1720 1725 1730	
cct ggg gtg cag gag tgc tac cat ggt aat gga cag agt tat cga ggc	5289
Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly	
1735 1740 1745	
aca tac tcc acc act gtc aca gga aga acc tgc caa gct tgg tca tct	5337
Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser	
1750 1755 1760	
atg aca cca cac tcg cat agt cgg acc cca gaa tac tac cca aat gct	5385
Met Thr Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala	
1765 1770 1775 1780	
ggc ttg atc atg aac tac tgc agg aat cca gat gct gtg gca gct cct	5433
Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro	
1785 1790 1795	
tat tgt tat acg agg gat ccc ggt gtc agg tgg gag tac tgc aac ctg	5481
Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu	
1800 1805 1810	
acg caa tgc tca gac gca gaa ggg act gcc gtc gcg cct ccg act gtt	5529
Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val	
1815 1820 1825	
acc ccg gtt cca agc cta gag gct cct tcc gaa caa gca ccg act gag	5577
Thr Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu	
1830 1835 1840	
caa agg cct ggg gtg cag gag tgc tac cat ggt aat gga cag agt tat	5625

Gln Arg Pro Gly Val	Gln Glu Cys Tyr His	Gly Asn Gly Gln Ser Tyr	
1845	1850	1855	1860
cga ggc aca tac tcc acc act gtc aca gga aga acc tgc caa gct tgg	5673		
Arg Gly Thr Tyr	Ser Thr Thr Val Thr	Gly Arg Thr Cys	Gln Ala Trp
	1865	1870	1875
tca tct atg aca cca cac tcg cat agt cgg acc cca gaa tac tac cca	5721		
Ser Ser Met Thr	Pro His Ser His Ser Arg Thr	Pro Glu Tyr Tyr	Pro
	1880	1885	1890
aat gct ggc ttg atc atg aac tac tgc agg aat cca gat gct gtg gca	5769		
Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala			
	1895	1900	1905
gct cct tat tgt tat acg agg gat ccc ggt gtc agg tgg gag tac tgc	5817		
Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys			
	1910	1915	1920
aac ctg acg caa tgc tca gac gca gaa ggg act gcc gtc gcg cct ccg	5865		
Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro			
	1925	1930	1935
act gtt acc ccg gtt cca agc cta gag gct cct tcc gaa caa gca ccg	5913		
Thr Val Thr Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro			
	1945	1950	1955
act gag caa agg cct ggg gtg cag gag tgc tac cat ggt aat gga cag	5961		
Thr Glu Gln Arg Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln			
	1960	1965	1970
agt tat cga ggc aca tac tcc acc act gtc aca gga aga acc tgc caa	6009		
Ser Tyr Arg Gly Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln			
	1975	1980	1985
gct tgg tca tct atg aca cca cac tcg cat agt cgg acc cca gaa tac	6057		
Ala Trp Ser Ser Met Thr Pro His Ser His Ser Arg Thr Pro Glu Tyr			
	1990	1995	2000
tac cca aat gct ggc ttg atc atg aac tac tgc agg aat cca gat gct	6105		
Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala			
	2005	2010	2015
gtg gca gct cct tat tgt tat acg agg gat ccc ggt gtc agg tgg gag	6153		
Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu			
	2025	2030	2035
tac tgc aac ctg acg caa tgc tca gac gca gaa ggg act gcc gtc gcg	6201		
Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala			
	2040	2045	2050
cct ccg act gtt acc ccg gtt cca agc cta gag gct cct tcc gaa caa	6249		
Pro Pro Thr Val Thr Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln			
	2055	2060	2065
gca ccg act gag caa agg cct ggg gtg cag gag tgc tac cat ggt aat	6297		
Ala Pro Thr Glu Gln Arg Pro Gly Val Gln Glu Cys Tyr His Gly Asn			

2070	2075	2080	
gga cag agt tat cga ggc aca tac tcc acc act gtc aca gga aga acc Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr 2085 2090 2095 2100			6345
tgc caa gct tgg tca tct atg aca cca cac tcg cat agt cgg acc cca Cys Gln Ala Trp Ser Ser Met Thr Pro His Ser His Ser Arg Thr Pro 2105 2110 2115			6393
gaa tac tac cca aat gct ggc ttg atc atg aac tac tgc agg aat cca Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro 2120 2125 2130			6441
gat gct gtg gca gct cct tat tgt tat acg agg gat ccc ggt gtc agg Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg 2135 2140 2145			6489
tgg gag tac tgc aac ctg acg caa tgc tca gac gca gaa ggg act gcc Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala 2150 2155 2160			6537
gtc gcg cct ccg act gtt acc ccg gtt cca agc cta gag gct cct tcc Val Ala Pro Pro Thr Val Thr Pro Val Pro Ser Leu Glu Ala Pro Ser 2165 2170 2175 2180			6585
gaa caa gca ccg act gag caa agg cct ggg gtg cag gag tgc tac cat Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly Val Gln Glu Cys Tyr His 2185 2190 2195			6633
ggt aat gga cag agt tat cga ggc aca tac tcc acc act gtc aca gga Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr Thr Val Thr Gly 2200 2205 2210			6681
aga acc tgc caa gct tgg tca tct atg aca cca cac tcg cat agt cgg Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His Ser His Ser Arg 2215 2220 2225			6729
acc cca gaa tac tac cca aat gct ggc ttg atc atg aac tac tgc agg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg 2230 2235 2240			6777
aat cca gat gct gtg gca gct cct tat tgt tat acg agg gat ccc ggt Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly 2245 2250 2255 2260			6825
gtc agg tgg gag tac tgc aac ctg acg caa tgc tca gac gca gaa ggg Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly 2265 2270 2275			6873
act gcc gtc gcg cct ccg act gtt acc ccg gtt cca agc cta gag gct Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro Ser Leu Glu Ala 2280 2285 2290			6921
cct tcc gaa caa gca ccg act gag caa agg cct ggg gtg cag gag tgc Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly Val Gln Glu Cys 2295 2300 2305			6969

tac cat ggt aat gga cag agt tat cga ggc aca tac tcc acc act gtc Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr Thr Val 2310 2315 2320	7017
aca gga aga acc tgc caa gct tgg tca tct atg aca cca cac tcg cat Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His Ser His 2325 2330 2335 2340	7065
agt cgg acc cca gaa tac tac cca aat gct ggc ttg atc atg aac tac Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr 2345 2350 2355	7113
tgc agg aat cca gat gct gtg gca gct cct tat tgt tat acg agg gat Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp 2360 2365 2370	7161
ccc ggt gtc agg tgg gag tac tgc aac ctg acg caa tgc tca gac gca Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala 2375 2380 2385	7209
gaa ggg act gcc gtc gcg cct ccg act gtt acc ccg gtt cca agc cta Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro Ser Leu 2390 2395 2400	7257
gag gct cct tcc gaa caa gca ccg act gag caa agg cct ggg gtg cag Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly Val Gln 2405 2410 2415 2420	7305
gag tgc tac cat ggt aat gga cag agt tat cga ggc aca tac tcc acc Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr 2425 2430 2435	7353
act gtc aca gga aga acc tgc caa gct tgg tca tct atg aca cca cac Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His 2440 2445 2450	7401
tcg cat agt cgg acc cca gaa tac tac cca aat gct ggc ttg atc atg Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met 2455 2460 2465	7449
aac tac tgc agg aat cca gat gct gtg gca gct cct tat tgt tat acg Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr 2470 2475 2480	7497
agg gat ccc ggt gtc agg tgg gag tac tgc aac ctg acg caa tgc tca Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser 2485 2490 2495 2500	7545
gac gca gaa ggg act gcc gtc gcg cct ccg act gtt acc ccg gtt cca Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro 2505 2510 2515	7593
agc cta gag gct cct tcc gaa caa gca ccg act gag caa agg cct ggg Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly 2520 2525 2530	7641

gtg cag gag tgc tac cat ggt aat gga cag agt tat cga ggc aca tac	7689
Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr	
2535 2540 2545	
tcc acc act gtc aca gga aga acc tgc caa gct tgg tca tct atg aca	7737
Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr	
2550 2555 2560	
cca cac tcg cat agt cgg acc cca gaa tac tac cca aat gct ggc ttg	7785
Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu	
2565 2570 2575 2580	
atc atg aac tac tgc agg aat cca gat gct gtg gca gct cct tat tgt	7833
Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys	
2585 2590 2595	
tat acg agg gat ccc ggt gtc agg tgg gag tac tgc aac ctg acg caa	7881
Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln	
2600 2605 2610	
tgc tca gac gca gaa ggg act gcc gtc gcg cct ccg act gtt acc ccg	7929
Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro	
2615 2620 2625	
gtt cca agc cta gag gct cct tcc gaa caa gca ccg act gag cag agg	7977
Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg	
2630 2635 2640	
cct ggg gtg cag gag tgc tac cac ggt aat gga cag agt tat cga ggc	8025
Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly	
2645 2650 2655 2660	
aca tac tcc acc act gtc act gga aga acc tgc caa gct tgg tca tct	8073
Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser	
2665 2670 2675	
atg aca cca cac tcg cat agt cgg acc cca gaa tac tac cca aat gct	8121
Met Thr Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala	
2680 2685 2690	
ggc ttg atc atg aac tac tgc agg aat cca gat gct gtg gca gct cct	8169
Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala Ala Pro	
2695 2700 2705	
tat tgt tat acg agg gat ccc ggt gtc agg tgg gag tac tgc aac ctg	8217
Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu	
2710 2715 2720	
acg caa tgc tca gac gca gaa ggg act gcc gtc gcg cct ccg act gtt	8265
Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Val	
2725 2730 2735 2740	
acc ccg gtt cca agc cta gag gct cct tcc gaa caa gca ccg act gag	8313
Thr Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu	
2745 2750 2755	
caa agg cct ggg gtg cag gag tgc tac cat ggt aat gga cag agt tat	8361

Gln Arg Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr	
2760	2765 2770
cga ggc aca tac tcc acc act gtc aca gga aga acc tgc caa gct tgg	8409
Arg Gly Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp	
2775	2780 2785
tca tct atg aca cca cac tcg cat agt cgg acc cca gaa tac tac cca	8457
Ser Ser Met Thr Pro His Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro	
2790	2795 2800
aat gct ggc ttg atc atg aac tac tgc agg aat cca gat gct gtg gca	8505
Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala Val Ala	
2805	2810 2815 2820
gct cct tat tgt tat acg agg gat ccc ggt gtc agg tgg gag tac tgc	8553
Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu Tyr Cys	
2825	2830 2835
aac ctg acg caa tgc tca gac gca gaa ggg act gcc gtc gcg cct ccg	8601
Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala Pro Pro	
2840	2845 2850
act gtt acc ccg gtt cca agc cta gag gct cct tcc gaa caa gca ccg	8649
Thr Val Thr Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro	
2855	2860 2865
act gag caa agg cct ggg gtg cag gag tgc tac cat ggt aat gga cag	8697
Thr Glu Gln Arg Pro Gly Val Gln Glu Cys Tyr His Gly Asn Gly Gln	
2870	2875 2880
agt tat cga ggc aca tac tcc acc act gtc aca gga aga acc tgc caa	8745
Ser Tyr Arg Gly Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln	
2885	2890 2895 2900
gct tgg tca tct atg aca cca cac tcg cat agt cgg acc cca gaa tac	8793
Ala Trp Ser Ser Met Thr Pro His Ser His Ser Arg Thr Pro Glu Tyr	
2905	2910 2915
tac cca aat gct ggc ttg atc atg aac tac tgc agg aat cca gat gct	8841
Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr Cys Arg Asn Pro Asp Ala	
2920	2925 2930
gtg gca gct cct tat tgt tat acg agg gat ccc ggt gtc agg tgg gag	8889
Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp Pro Gly Val Arg Trp Glu	
2935	2940 2945
tac tgc aac ctg acg caa tgc tca gac gca gaa ggg act gcc gtc gcg	8937
Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala Glu Gly Thr Ala Val Ala	
2950	2955 2960
cct ccg act gtt acc ccg gtt cca agc cta gag gct cct tcc gaa caa	8985
Pro Pro Thr Val Thr Pro Val Pro Ser Leu Glu Ala Pro Ser Glu Gln	
2965	2970 2975 2980
gca ccg act gag cag agg cct ggg gtg cag gag tgc tac cac ggt aat	9033
Ala Pro Thr Glu Gln Arg Pro Gly Val Gln Glu Cys Tyr His Gly Asn	

2985								2990					2995				
gga	cag	agt	tat	cga	ggc	aca	tac	tcc	acc	act	gtc	act	gga	aga	acc	9081	
Gly	Gln	Ser	Tyr	Arg	Gly	Thr	Tyr	Ser	Thr	Thr	Val	Thr	Gly	Arg	Thr		
3000								3005					3010				
tgc	caa	gct	tgg	tca	tct	atg	aca	cca	cac	tcg	cat	agt	cgg	acc	cca	9129	
Cys	Gln	Ala	Trp	Ser	Ser	Met	Thr	Pro	His	Ser	His	Ser	Arg	Thr	Pro		
3015								3020					3025				
gaa	tac	tac	cca	aat	gct	ggc	ttg	atc	atg	aac	tac	tgc	agg	aat	cca	9177	
Glu	Tyr	Tyr	Pro	Asn	Ala	Gly	Leu	Ile	Met	Asn	Tyr	Cys	Arg	Asn	Pro		
3030								3035					3040				
gat	gct	gtg	gca	gct	cct	tat	tgt	tat	acg	agg	gat	ccc	ggt	gtc	agg	9225	
Asp	Ala	Val	Ala	Ala	Pro	Tyr	Cys	Tyr	Thr	Arg	Asp	Pro	Gly	Val	Arg		
3045								3050					3055				3060
tgg	gag	tac	tgc	aac	ctg	acg	caa	tgc	tca	gac	gca	gaa	ggg	act	gcc	9273	
Trp	Glu	Tyr	Cys	Asn	Leu	Thr	Gln	Cys	Ser	Asp	Ala	Glu	Gly	Thr	Ala		
3065								3070					3075				
gtc	gcg	cct	ccg	act	gtt	acc	ccg	gtt	cca	agc	cta	gag	gct	cct	tcc	9321	
Val	Ala	Pro	Pro	Thr	Val	Thr	Pro	Val	Pro	Ser	Leu	Glu	Ala	Pro	Ser		
3080								3085					3090				
gaa	caa	gca	ccg	act	gag	cag	agg	cct	ggg	gtg	cag	gag	tgc	tac	cac	9369	
Glu	Gln	Ala	Pro	Thr	Glu	Gln	Arg	Pro	Gly	Val	Gln	Glu	Cys	Tyr	His		
3095								3100					3105				
ggt	aat	gga	cag	agt	tat	cga	ggc	aca	tac	tcc	acc	act	gtc	act	gga	9417	
Gly	Asn	Gly	Gln	Ser	Tyr	Arg	Gly	Thr	Tyr	Ser	Thr	Thr	Val	Thr	Gly		
3110								3115					3120				
aga	acc	tgc	caa	gct	tgg	tca	tct	atg	aca	cca	cac	tcg	cat	agt	cgg	9465	
Arg	Thr	Cys	Gln	Ala	Trp	Ser	Ser	Met	Thr	Pro	His	Ser	His	Ser	Arg		
3125								3130					3135				3140
acc	cca	gaa	tac	tac	cca	aat	gct	ggc	ttg	atc	atg	aac	tac	tgc	agg	9513	
Thr	Pro	Glu	Tyr	Tyr	Pro	Asn	Ala	Gly	Leu	Ile	Met	Asn	Tyr	Cys	Arg		
3145								3150					3155				
aat	cca	gat	gct	gtg	gca	gct	cct	tat	tgt	tat	acg	agg	gat	ccc	ggt	9561	
Asn	Pro	Asp	Ala	Val	Ala	Ala	Pro	Tyr	Cys	Tyr	Thr	Arg	Asp	Pro	Gly		
3160								3165					3170				
gtc	agg	tgg	gag	tac	tgc	aac	ctg	acg	caa	tgc	tca	gac	gca	gaa	ggg	9609	
Val	Arg	Trp	Glu	Tyr	Cys	Asn	Leu	Thr	Gln	Cys	Ser	Asp	Ala	Glu	Gly		
3175								3180					3185				
act	gcc	gtc	gcg	cct	ccg	act	gtt	acc	ccg	gtt	cca	agc	cta	gag	gct	9657	
Thr	Ala	Val	Ala	Pro	Pro	Thr	Val	Thr	Pro	Val	Pro	Ser	Leu	Glu	Ala		
3190								3195					3200				
cct	tcc	gaa	caa	gca	ccg	act	gag	cag	agg	cct	ggg	gtg	cag	gag	tgc	9705	
Pro	Ser	Glu	Gln	Ala	Pro	Thr	Glu	Gln	Arg	Pro	Gly	Val	Gln	Glu	Cys		
3205								3210					3215				3220

tac cac ggt aat gga cag agt tat cga ggc aca tac tcc acc act gtc	9753
Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr Thr Val	
3225 3230 3235	
act gga aga acc tgc caa gct tgg tca tct atg aca cca cac tcg cat	9801
Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His Ser His	
3240 3245 3250	
agt cgg acc cca gaa tac tac cca aat gct ggc ttg atc atg aac tac	9849
Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met Asn Tyr	
3255 3260 3265	
tgc agg aat cca gat gct gtg gca gct cct tat tgt tat acg agg gat	9897
Cys Arg Asn Pro Asp Ala Val Ala Ala Pro Tyr Cys Tyr Thr Arg Asp	
3270 3275 3280	
ccc ggt gtc agg tgg gag tac tgc aac ctg acg caa tgc tca gac gca	9945
Pro Gly Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser Asp Ala	
3285 3290 3295 3300	
gaa ggg act gcc gtc gcg cct ccg act gtt acc ccg gtt cca agc cta	9993
Glu Gly Thr Ala Val Ala Pro Pro Thr Val Thr Pro Val Pro Ser Leu	
3305 3310 3315	
gag gct cct tcc gaa caa gca ccg act gag cag agg cct ggg gtg cag	10041
Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly Val Gln	
3320 3325 3330	
gag tgc tac cac ggt aat gga cag agt tat cga ggc aca tac tcc acc	10089
Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Arg Gly Thr Tyr Ser Thr	
3335 3340 3345	
act gtc act gga aga acc tgc caa gct tgg tca tct atg aca cca cac	10137
Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr Pro His	
3350 3355 3360	
tcg cat agt cgg acc cca gaa tac tac cca aat gct ggc ttg atc atg	10185
Ser His Ser Arg Thr Pro Glu Tyr Tyr Pro Asn Ala Gly Leu Ile Met	
3365 3370 3375 3380	
aac tac tgc agg aat cca gat cct gtg gca gcc cct tat tgt tat acg	10233
Asn Tyr Cys Arg Asn Pro Asp Pro Val Ala Ala Pro Tyr Cys Tyr Thr	
3385 3390 3395	
agg gat ccc agt gtc agg tgg gag tac tgc aac ctg aca caa tgc tca	10281
Arg Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu Thr Gln Cys Ser	
3400 3405 3410	
gac gca gaa ggg act gcc gtc gcg cct cca act att acc ccg att cca	10329
Asp Ala Glu Gly Thr Ala Val Ala Pro Pro Thr Ile Thr Pro Ile Pro	
3415 3420 3425	
agc cta gag gct cct tct gaa caa gca cca act gag caa agg cct ggg	10377
Ser Leu Glu Ala Pro Ser Glu Gln Ala Pro Thr Glu Gln Arg Pro Gly	
3430 3435 3440	

gtg cag gag tgc tac cac gga aat gga cag agt tat caa ggc aca tac	10425
Val Gln Glu Cys Tyr His Gly Asn Gly Gln Ser Tyr Gln Gly Thr Tyr	
3445 3450 3455 3460	
ttc att act gtc aca gga aga acc tgc caa gct tgg tca tct atg aca	10473
Phe Ile Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser Met Thr	
3465 3470 3475	
cca cac tcg cat agt cgg acc cca gca tac tac cca aat gct ggc ttg	10521
Pro His Ser His Ser Arg Thr Pro Ala Tyr Tyr Pro Asn Ala Gly Leu	
3480 3485 3490	
atc aag aac tac tgc cga aat cca gat cct gtg gca gcc cct tgg tgt	10569
Ile Lys Asn Tyr Cys Arg Asn Pro Asp Pro Val Ala Ala Pro Trp Cys	
3495 3500 3505	
tat aca aca gat ccc agt gtc agg tgg gag tac tgc aac ctg aca cga	10617
Tyr Thr Thr Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu Thr Arg	
3510 3515 3520	
tgc tca gat gca gaa tgg act gcc ttc gtc cct ccg aat gtt att ctg	10665
Cys Ser Asp Ala Glu Trp Thr Ala Phe Val Pro Pro Asn Val Ile Leu	
3525 3530 3535 3540	
gct cca agc cta gag gct ttt ttt gaa caa gca ctg act gag gaa acc	10713
Ala Pro Ser Leu Glu Ala Phe Phe Glu Gln Ala Leu Thr Glu Glu Thr	
3545 3550 3555	
ccc ggg gta cag gac tgc tac tac cat tat gga cag agt tac cga ggc	10761
Pro Gly Val Gln Asp Cys Tyr Tyr His Tyr Gly Gln Ser Tyr Arg Gly	
3560 3565 3570	
aca tac tcc acc act gtc aca gga aga act tgc caa gct tgg tca tct	10809
Thr Tyr Ser Thr Thr Val Thr Gly Arg Thr Cys Gln Ala Trp Ser Ser	
3575 3580 3585	
atg aca cca cac cag cat agt cgg acc cca gaa aac tac cca aat gct	10857
Met Thr Pro His Gln His Ser Arg Thr Pro Glu Asn Tyr Pro Asn Ala	
3590 3595 3600	
ggc ctg acc agg aac tac tgc agg aat cca gat gct gag att cgc cct	10905
Gly Leu Thr Arg Asn Tyr Cys Arg Asn Pro Asp Ala Glu Ile Arg Pro	
3605 3610 3615 3620	
tgg tgt tac acc atg gat ccc agt gtc agg tgg gag tac tgc aac ctg	10953
Trp Cys Tyr Thr Met Asp Pro Ser Val Arg Trp Glu Tyr Cys Asn Leu	
3625 3630 3635	
aca caa tgc ctg gtg aca gaa tca agt gtc ctt gca act ctc acg gtg	11001
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